

What is SOA and why should I care?

"For over 17 years, ISS has been assisting clients transform their IT departments into agile, responsive organizations that successfully deliver high quality business-aligned solutions on time and on budget... meeting or exceeding customer expectations."



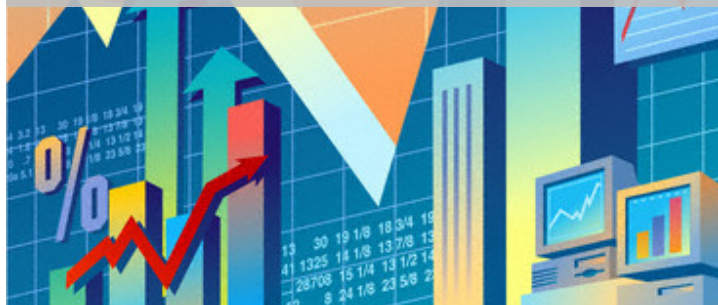
Change & Agility

Strategic SOA

What Is IT From A Business Perspective



**Business
Only Please**



- IT is a Business Resource
- Business Resources Focus On Addressing Business Problems
- How Do We Leverage Business Resources (IT and Others) to Address Problems....Service Orientation.
- Service Orientation is **NOT** IT Centric! Its Business Centric.

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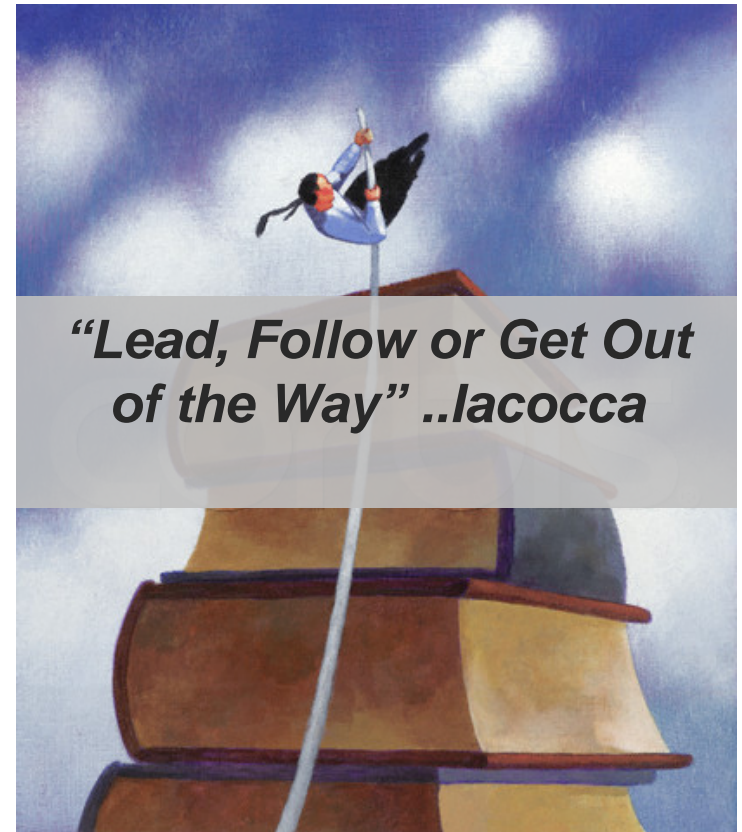


Change & Agility

Strategic SOA

Organizational Agility

- Ability to Respond Quickly **AND** Efficiently and Leverage Change for Constituency Advantages
- Two Parts
 - Tactical: Ability to Respond – Faster is Better!
 - Strategic: Leverage Change for Advantage



"Lead, Follow or Get Out of the Way" ..Iacocca

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Impact of the Web

- Anyone can use our applications
- And if they can't – they want to know **why not?**
- Virtualized distributed applications
- Accessible from anywhere
- Complex architectures become common
- Urgent need to link applications:
 - Stock, Ordering, Shipping, Invoicing



Further Motivation

- Mergers
 - Linking multiple systems from each organisation
- Demergers
 - Allowing simple separation of systems
 - With security, across the internet
- Outsourcing
 - Using services via the Internet



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Globalization

- New Global Competition...pick one! China:
 - 360,000 new engineers per year join China's workforce
 - 39 cents per hour for industry laborers, and \$20 per month for general laborers
 - Hundreds of thousands of jobs are disappearing in North America
 - Natural resource and energy prices are skyrocketing, in part because of increased global demand

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And if that wasn't enough!

- Regulatory pressures
 - Sarbanes Oxley was just the beginning
 - Compliance and regulatory measures in every industry
- Processes and systems need to be flexible
- Must be **manageable** and **governable**

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Changed landscape

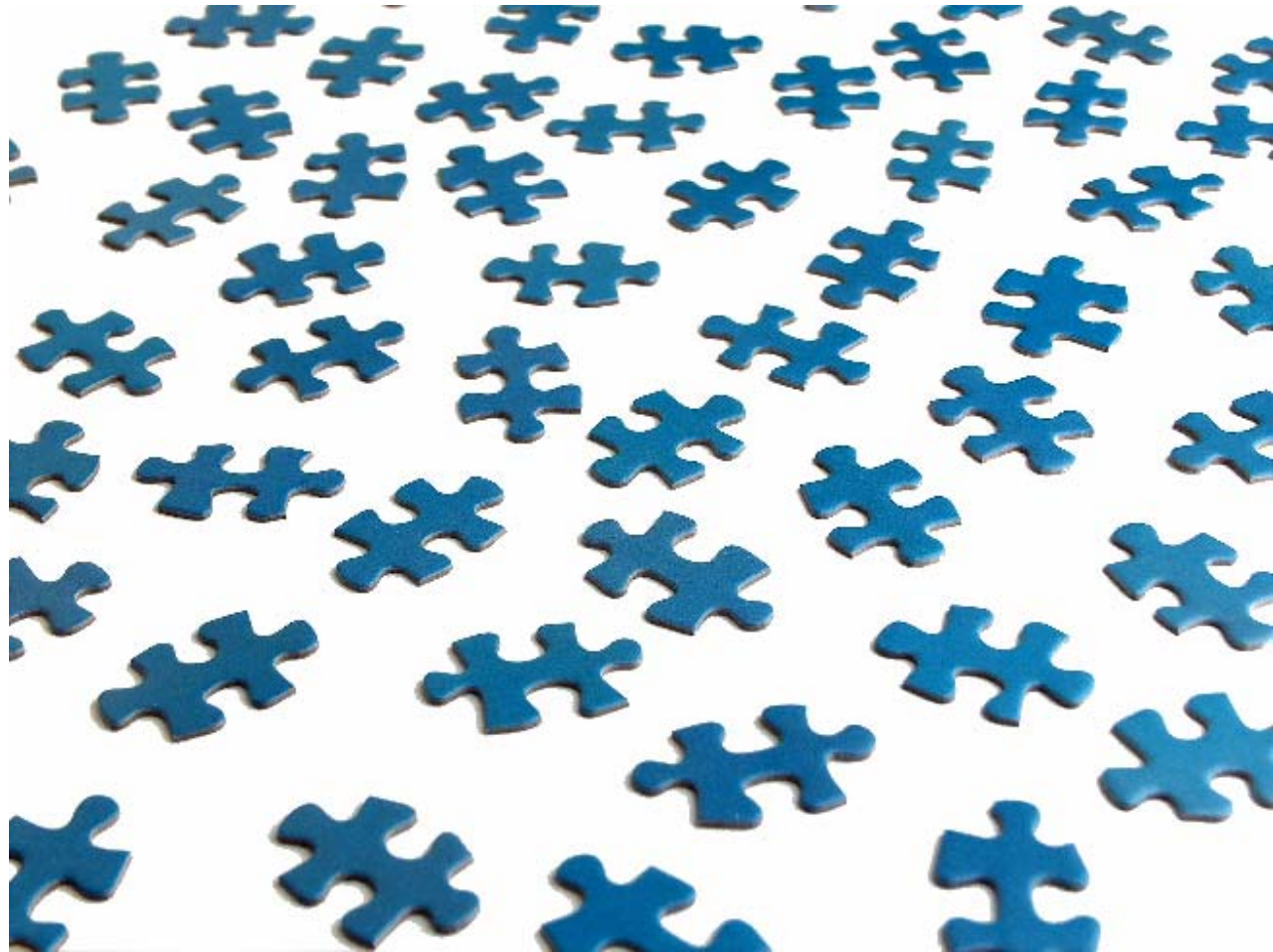
- Development cycles:
 - From 18 to 6 months to 3 months
- Real standards
 - HTTP, HTML, XML, Java
- Supply chain management and integration are key

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Integrate or bust

Integration



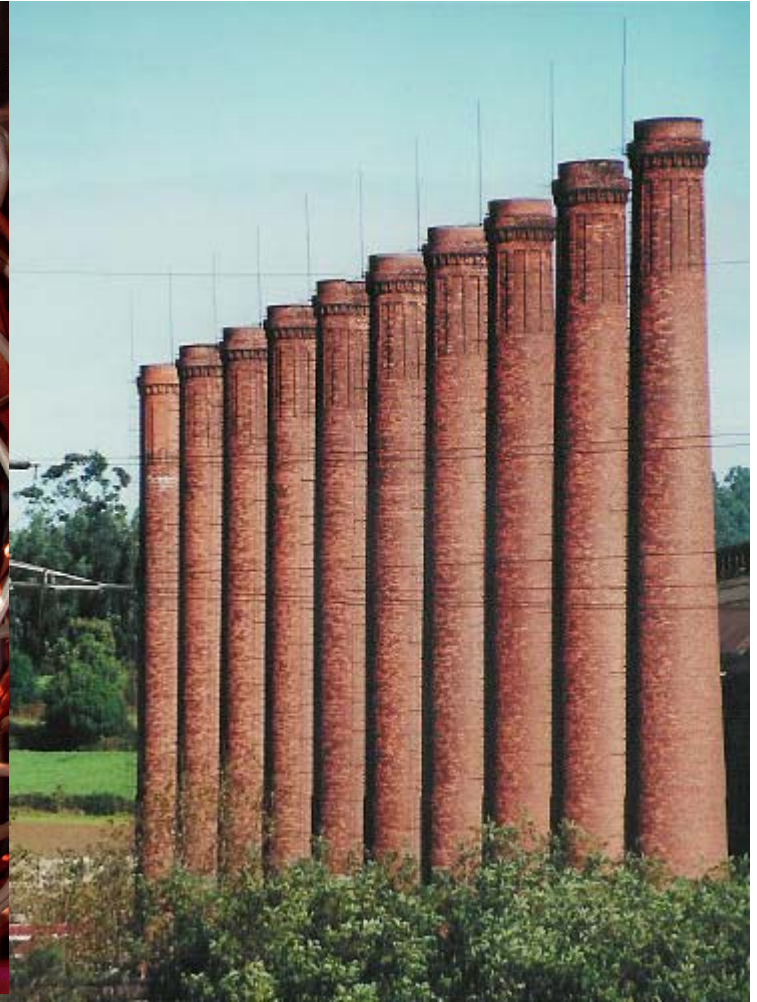
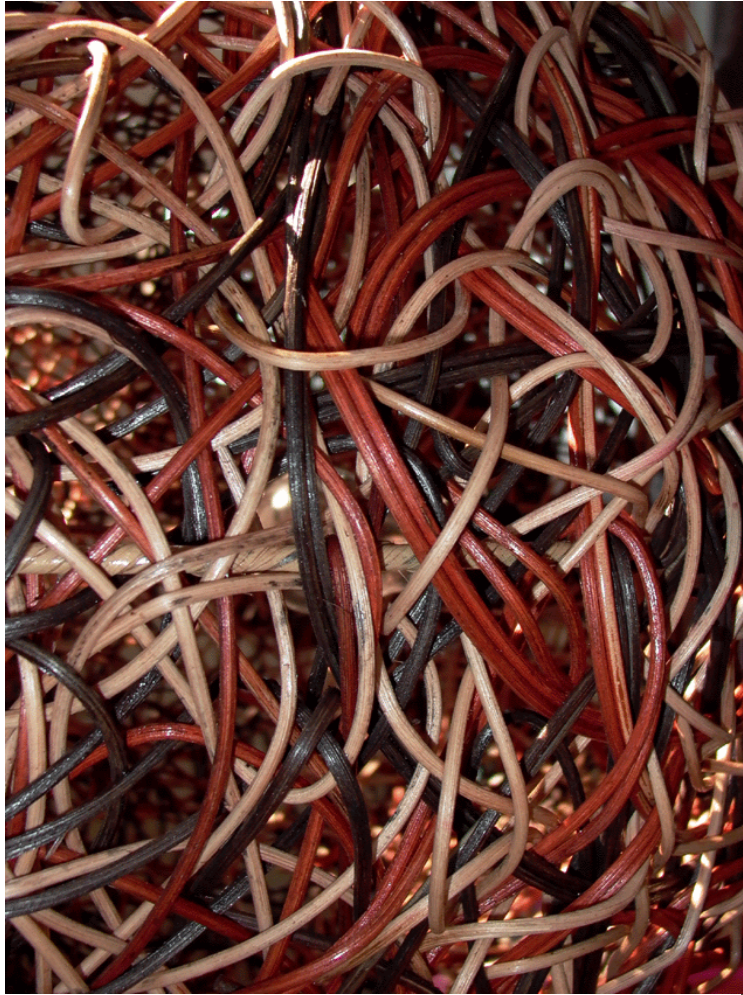
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Take your pick!



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“Stovepipe” Model

- Each department / division managed its own systems
- Each system was 100% standalone
 - Robust
 - Easy to manage
 - Inflexible
 - Hard to integrate
 - Hard add new compliance

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Integration tangle

- Ad-hoc integration between systems
- Multiple technologies, protocols, systems
- Got the job done at the time
- Impossible to manage
- Dependencies have spread and no-one can change anything

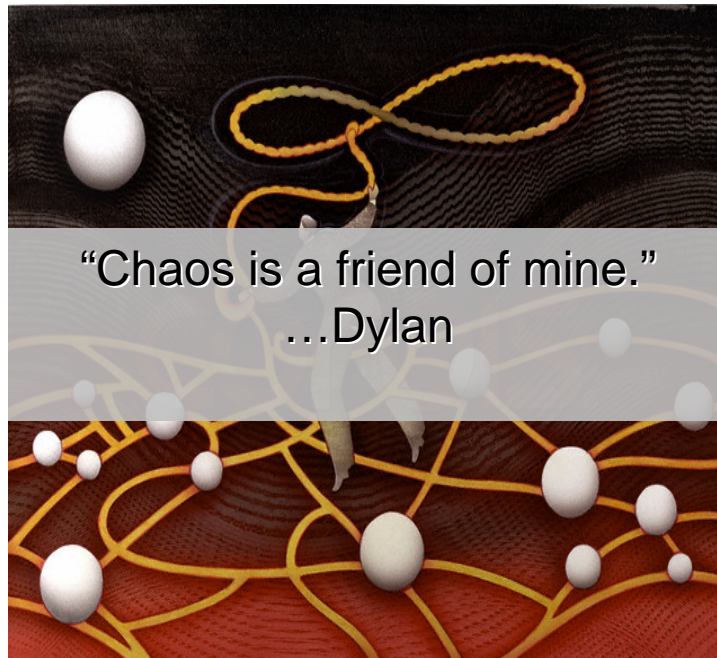
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IT Yarn Ball

Strategic SOA

The ROI Paradigm....



- Creating the Ball
 - ROI = focus on the short-term (this month, quarter, maybe a year)
 - Least Expensive, Most Expedient Choice
 - Yarn Ball of connections, process and dependencies
 - Geometric (n^2) compounding with each decision
 - More Expensive & Hopeless
- Must Untangle The Mess...Not Start Over



Integration

- Model has been either:
 - Getting *Data* from one system to another
 - Using *Function* in one system from another
- Typically done using a network
 - Common data store, files, in-memory, cut and paste
- Not forgetting the most common models:
 - **Fax, typist, phone call, printout, paper**

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Exercise



Discussion

What kinds of integration channels
do you have in your organization?

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Integration points

- Data
 - Integration in the database layer
- Application
 - Inter-application integration
- Web tier
 - Portal based integration
- On-the-glass
 - Cut and paste

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The eBusiness Debacle

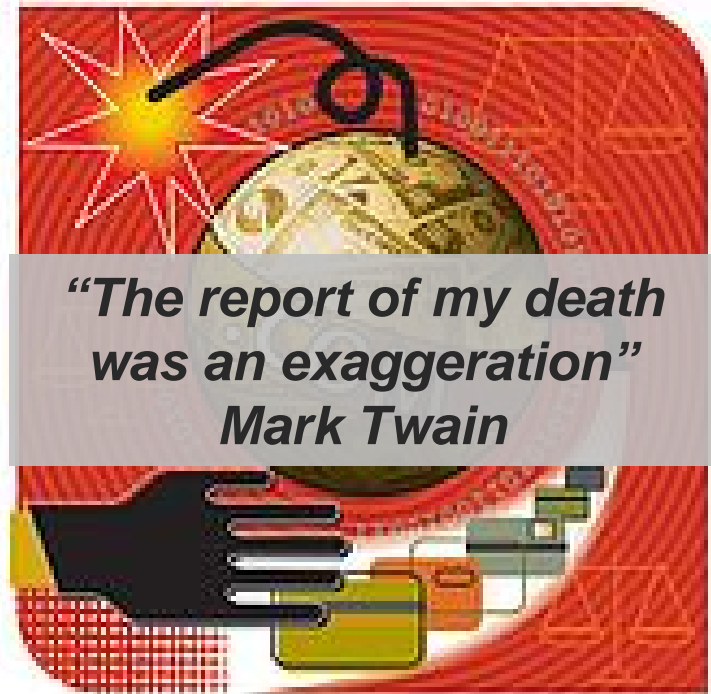
Strategic SOA

eBusiness Is Dead...Right?

- Don't throw the IT baby Out with the new economy Bath Water.
- Internet...
 - Didn't just penetrate business...it transformed it!
 - Business Avenues Today Which Were Not Possible Ten Years Ago
 - Do You Use The Internet Today?
- eBusiness has also spread to non-Internet systems
 - Mobile Phones,
 - Intranets

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What has fuelled the Internet?

- Open Standards
 - Different systems in different countries work in the same way
- Consistency
 - The same interface worked lots of places
 - Now people prefer web interfaces because they are familiar
- Ubiquity
 - Telcos made it available everywhere
- The network effect...
- Free-ish
 - But also ways to make money

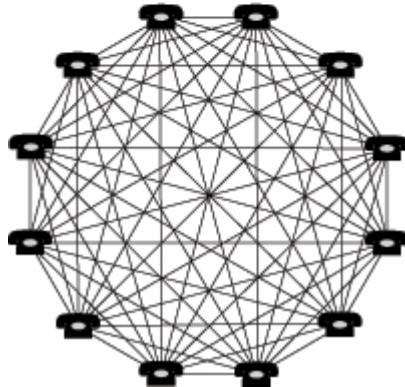
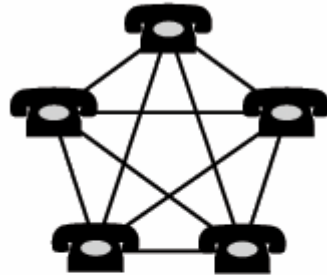
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The Network Effect



Whoever bought that first fax machine got a really bad deal!!



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Loose Coupling

Strategic SOA

- Types of Standards
 - De Jure Standard:
 - Created by organizations
 - De Facto Standard:
 - Created by a small group
 - Taken up widely because they are useful
- Often life is a combination of both:
 - TCP/IP and the Internet didn't **start** as Standards

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De Facto

An example (maybe)

- Rail Road Example (De Facto):
 - Rail Width = 4' 8.5"
 - First English railways based on carts
 - Carts were based on ruts in old Roman roads
 - Ruts were based on Roman Chariots
 - Roman Chariots based on the width of two horses
 - So:
 - Now you know which horse's rear invented standards

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Loose Coupling

Strategic SOA

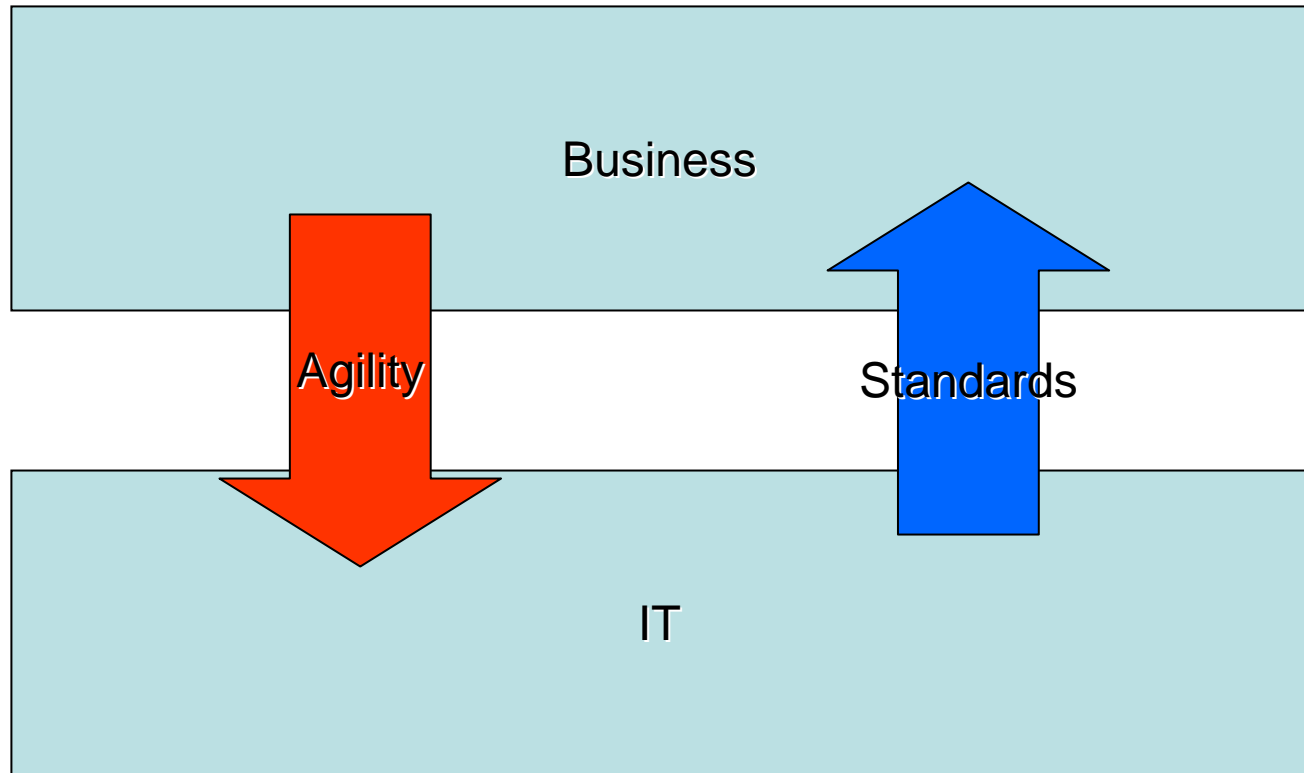
The Role of Open Standards

- Not proprietary to any one company
- Available for anyone to develop or use
- Supports Interoperability
- Prevents "Lock-In"
- Some Issues:
 - Standards Are Agreements = Compromise.
 - Too Many of Them, Tremendous Confusion and Overlap Until The Dust Settles
- The "right" Standards improve reuse, agility, and adoption

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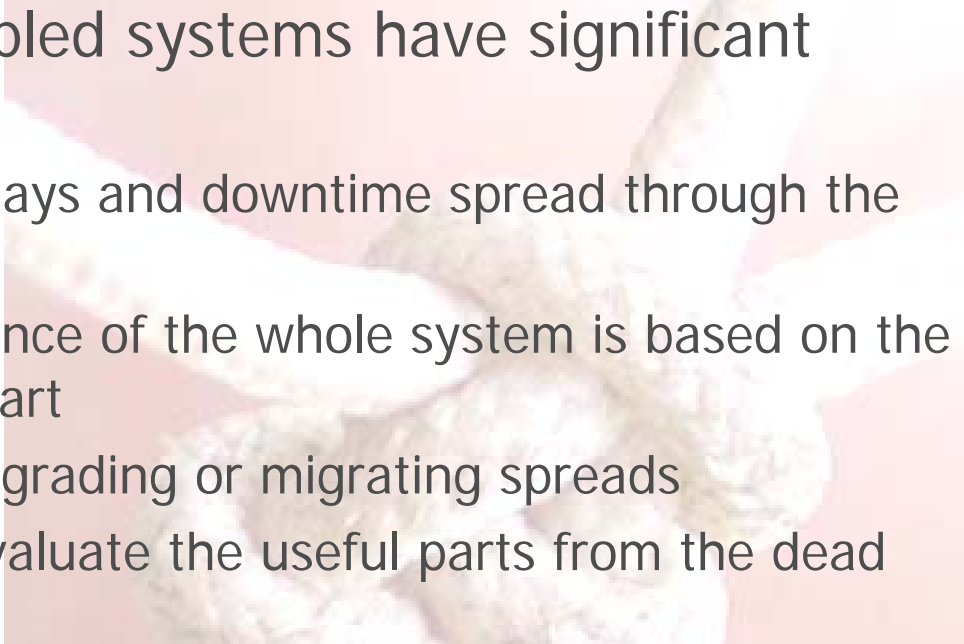
One way of looking at SOA



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Tightly coupled

- Tightly coupled systems have significant problems:
 - Errors, delays and downtime spread through the system
 - The resilience of the whole system is based on the weakest part
 - Cost of upgrading or migrating spreads
 - Hard to evaluate the useful parts from the dead weight
- 

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Loose coupling



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Loose Coupling

- Is about allowing enough flexibility in the system to let it work
- In fact its not a new idea:
 - Most every early integration system had loose-coupling
 - They are known as **employees**

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"6 Degrees of Separation"

- Location
- Access
- Programming Language
- Stack/Vendor
- Time
- Scalability

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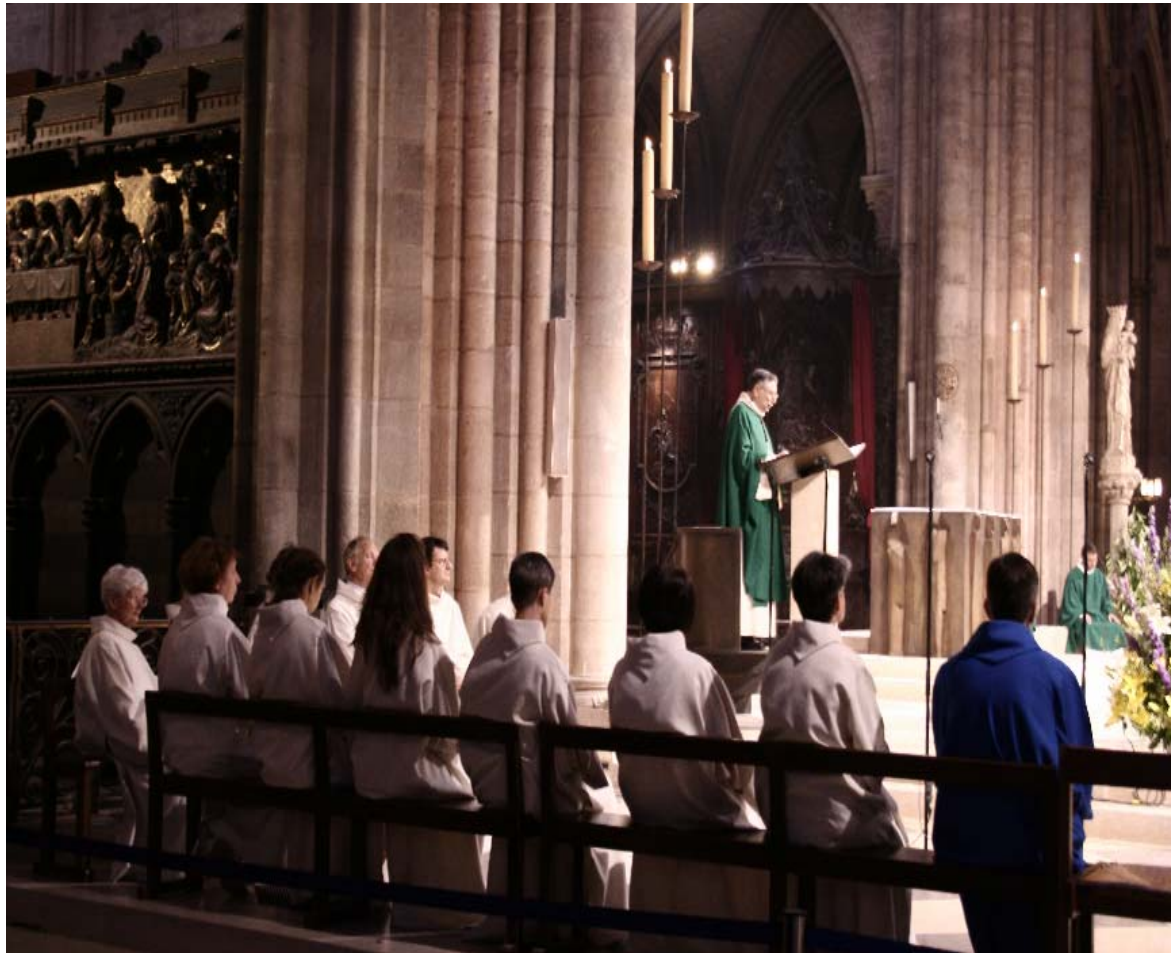


What is a Service?

Service?



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Service?



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Service



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Service

- Services are **application assets** that provide useful function
- The service is not just the software... it is the **running** system
- Services are **accessible** in a common way across the network and organization
- Services are **re-usable building blocks** that can be re-used to build other applications

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Loosely Coupled

- Services are fundamentally
 - *Message based*
- Can be *Asynchronous*
- No dependency on a given technology or language
 - Based on XML, or some other neutral message structure
- No dependency on a given system – can be migrated, relocated or replaced

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What does a service look like?

- It has to be running somewhere!
- We all know what services are because we use them every day:
 - Yahoo Finance to check on share prices
 - Google Maps to find things
 - Weather pages to get a forecast

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A service is not:

```
public class Spy implements Service {  
    public Information  
        checkEmployee(Employee e) {  
            return this.whatAreTheyUpTo(e);  
        }  
}
```

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The external view of a Service

- What does it do? The function
 - Typically human-readable documentation
- How can I use it?
 - The Interface – messages in and out, their format
 - Requirements – what security model? Reliability?
 - Capabilities – does it support digital signatures?
- The Service Level Agreement (SLA)
 - What response time guarantees are there?
 - When is it up?
- How much does it cost?

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The internal view of a Service



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Contracts

- Contract based development
- Start with the business need not the code
- Build high-level process definitions and data models
- Agree SLAs, Reliability and Security Requirements





Contracts are Standards

- Maybe not industry wide – but enough to get some “network effect”

Remember this:

- Not proprietary to any one ~~company~~ department
- Available for anyone to develop or use
- Supports Interoperability
- Prevents “Lock-In”
- Some Issues:
 - Standards Are Agreements = Compromise.
 - Too Many of Them, Tremendous Confusion and Overlap Until The Dust Settles
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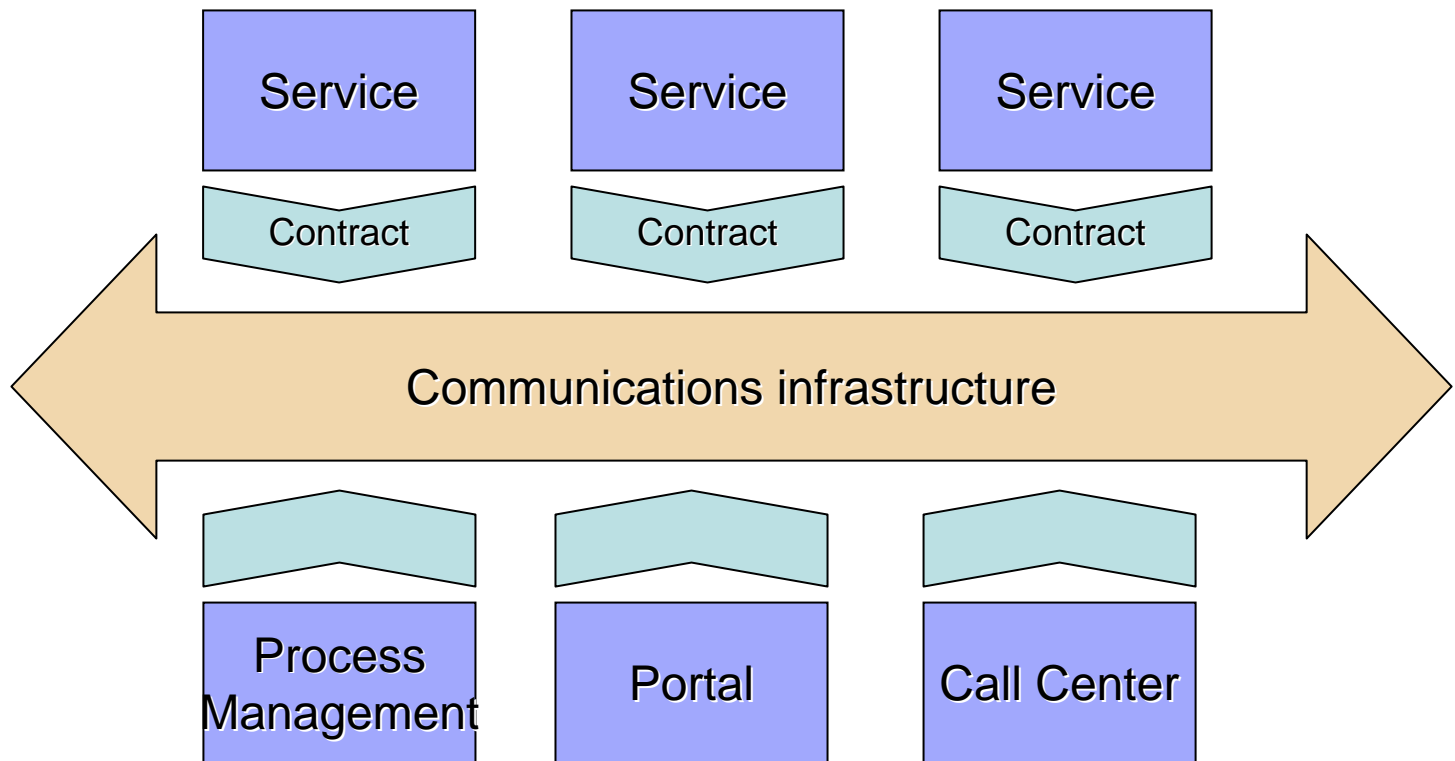


Service Oriented Architecture

- Emerged from:
 - Web based systems
 - Multi-tier architecture
 - Pressure to integrate
- Applications are exposed to the rest of the business as services
- SOA requires that services:
 - Published, available and **documented**
 - Have **contracts**
 - Are **re-usable**

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Service Oriented Architecture





Service Oriented Architecture

- SOA is gaining in popularity because it simplifies connecting systems.
- Integration is being driven by a number of factors:
 - **Straight-through-processing**
 - Handling web transactions without manual intervention, leading to greater scalability
 - **Mergers and demergers**
 - The increasing change in organisational structure is making loosely-coupled connections more important
 - **Partnerships, value-chains, outsourcing**
 - The ability to efficiently do business with third-parties is driving web-based integration technologies
 - **Time-to-Value**
 - Companies are demanding faster results from IT
 - SOA enables faster development of business processes using BPM tools and re-using existing services

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Service Oriented Architecture

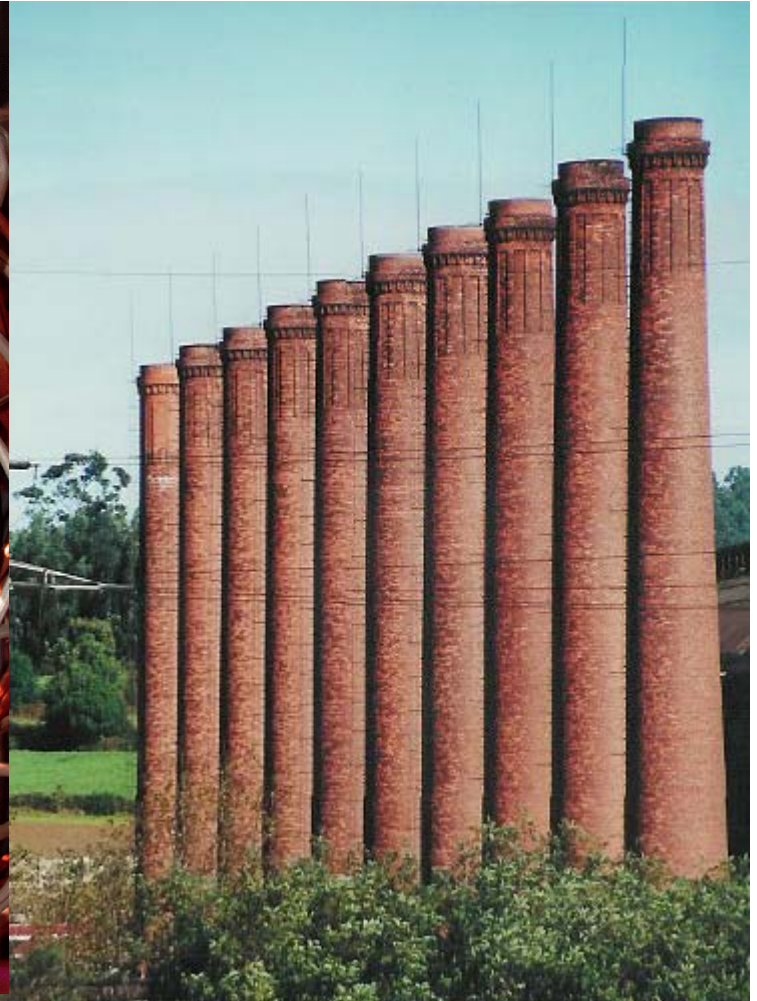
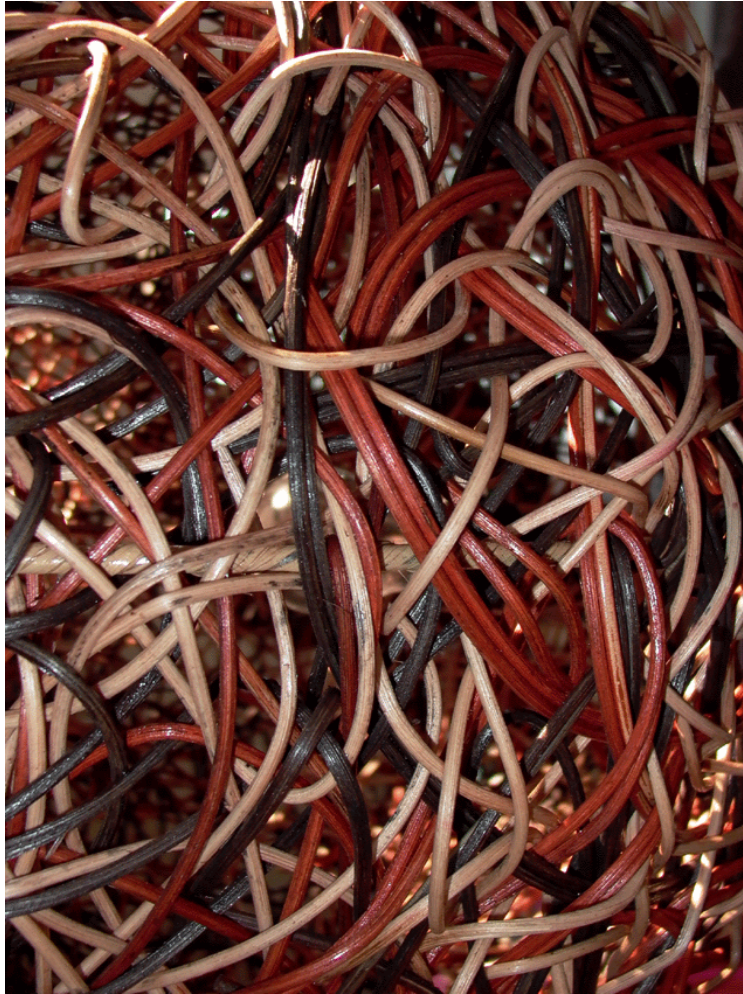
- SOA is an Enterprise Architecture not an application architecture
 - At a level higher than Object-Orientation
- The primary concept is loose-coupling
- Individual applications utilize *services* from across the network to provide common function
- The user of a service is independent of the implementation of any services it uses.

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SOA moves from:...



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...to:



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SOA and Business

- SOA is about aligning IT to the business
- Services should be owned, managed and organised by business domain
 - Not by business unit
- A domain is a related set of business function
 - With a common purpose and model

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Summary

- SOA:
 - Aligns IT to **business**
 - Delivers on **Loose-coupling**
 - Makes **re-use** possible shortening development cycles
 - Enables better **integration**

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Resources

- <http://www.enterpriseintegrationpatterns.com/>
- <http://www.looselycoupled.com>

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Exercise



Workshop/Hands On

15 minutes:

1. What do you see as the top 3 *benefits* of SOA to your organisation?
2. And the top 3 challenges?
3. Identify at least two “services” that could be shared and re-used



Questions?



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